

November 18, 2012

Elizabeth Nicoletti  
Senior Port Engineer  
Washington State Ferries  
2901 3<sup>rd</sup> Ave. Ste.500  
Seattle, WA 98121

Ms. Nicoletti,

I was dispatched to the Walla Walla at the Eagle Harbor repair facility on November 4, 2012 in the capacity of Master to observe operations as the vessel pushed the dock. I arrived at 0845 and waited in the number one end pilot house until approximately 1030 when the Staff Chief Engineer contacted me. He informed me that they would be "bumping" the shaft ahead. This was done twice. Shortly after 1100, he informed me that the vessel would push the dock at 40 rpm. Around 1120, the General Alarm sounded and the Staff Chief informed me that they had observable smoke, but no flame in the engine room and he would keep me informed as more was known. At approximately 1300, the Staff Chief informed me that the vessel had suffered a catastrophic failure in the number one drive motor and no further trials would be conducted.

Respectfully,

Cynthia Bruner

#1A Drive Motor Incident  
MV Walla Walla  
11/8/2012

On November 4<sup>th</sup>, 2012, the ferry MV Walla Walla was birthed at WSF's Eagle Harbor repair facility. Electric Shop was in the process of stoning the commutator of 2B Drive Motor (DM) in #2 Motor Room.

The plan was to turn the shaft with the A propulsion loop and stone the B1 motor on the B loop. Captain Cynthia Bruner was in #1 Wheel House standing by.

Configuration:

- #1A DM had all brush and boxes removed except one set
- #1B DM was intact
- #2A DM was intact
- #2B DM had all brushes and boxes removed
- #2 exciters on line
- #1 exciters locked out
- 2A Drive Motor only selected on exciter setup switch
- Plant in equal mode
- #3 Main Engine (ME) on line

All the brush boxes were removed from 2B motor, a wooden stone guide was installed as well as a vacuum tube. #3 ME was online to provide power to the A loop. Being motor 2B was to be stoned no power was applied to B loop.

At 1015 hr Propulsion Reset button was reset, #3 ME was placed in "Standby" and the shaft was "bumped" in the ahead direction to test rotation. The proper wooden block was installed and readied for stoning.

At 1049 hr #3 ME was then put back online and the shaft was brought up to 40 RPM's. The electricians, Mark Levang as Lead, began stoning the commutator. I went back to the #2 Motor Room to observe the stoning of the commutator. After a period of time C/E Settles called on the radio to say that the shaft had slowed to 30 RPM's. Lead Electrician Levang wanted the RPM brought back up to 40 rpm, which I relayed. He then requested the DM fan turned on. When I noted the fan damper was still closed and went to investigate the general alarm was sounded indicating a fire. At 1057 hr 1A Drive Motor Air Temp High alarm sounded. About this time, I was told, Oiler Steve Sourelos had seen smoke coming from the #1 Motor Room and he found the #1 DM arcing. He ran back to the Control Room and notified CE Settles who then secured the alternator setup switch and secured the ME. Under direction, Oiler Sourelos secured the Motor Room WTD, rang the General Alarm and stood-by suited up in Bunker gear. At 1059 hr, Chief John Settles secured #3 Main Engine and dropped out the propulsion loop. He told me that he saw through the Plexiglas port,

via the Motor Room camera, arcing and smoke coming from #1A motor. Once the propulsion was secured the arcing stopped.

We, crew and electricians, mustered in the Control Room and watched the situation via the camera for 45 minutes before pressurizing the Engine Room, opening the WTD and venting smoke through the Motor Room aft escape hatch to atmosphere. During this time I did not see arcing, fire or new smoking. We then went back and looked into the Plexiglas port and noted the damage. I told everyone not to open up the cover. We would wait until after lunch and let things cool down and gases vent off. I continued to monitor the camera during lunch.

After lunch we opened the cover and we saw the damaged commutator. I contacted Port Engineer Mullan and informed him of the situation. He requested photos and I complied. He later requested that we isolate the motor issue, clear the commutator and continue stoning. After a discussion, I told the electricians not to touch anything and that we would leave things as is for safety and any possible investigation.

At this point, the day's motor activity was concluded.

No one was injured by this event.

Bruce Cooper, SCE  
MV Walla Walla

John Settles

4/11/2012

ASCE Walla Walla

### Statement of events

I, John Settles, Alternate Staff Chief Engineer, of the M/V Walla Walla, boarded the vessel that morning about 0645, several crew members were already aboard; several more including the Staff Chief Engineer (SCE), Bruce Cooper (BAC), came aboard as well. Shortly thereafter, Eagle Harbor (EH) electricians came aboard; seven or eight in total, in preparation for hand stoning the commutators. The plan was to hand stone each of the commutators, four total, starting with drive motor (DM) 2A, in the #2 motor room.

I locked out and tagged out (LOTO) the drive motor heaters; EH electricians proceeded to remove parts in drive motors 1A, 1B and 2B. Other EH electricians (2), restored rectifiers 1-4 for start up.

A discussion was had about prop rotation and possibly changing the fields to reverse rotation. BAC looked up the drawings and determined that we had right handed props, it was also decided to bump the DM at start up to verify rotation.

The Captain arrived on the bridge about 9:10.

BAC suggested there may already be blocks made up for "A" and "B" motor, specific for stoning. Mark Levang went back to the shop to look for them and returned with motor specific blocks.

0920 started #3 ME for loop A.

About 1020, I proceeded to the #1 motor room to look at and compare each DM/ commutator/ brush configuration with what was happening in the #2 end motor specific for hand stoning.

At 1040, I removed the LOTO on drive motor exciters 2A, 2B and 2 standby, closed exciter cabinet breakers in the #2 MR, in preparation to run the plant on loop A.

1050 prepared to bump the DM, couldn't get fields to come up, snapped in the prop alternator #3, fields came up, and BAC bumped the DM. Determined from rotation that the stones needed to be repositioned to the other side. We shut down the DM, LOTO'd breakers, EH electricians repositioned the stones, we got the okay, removed LOTO's and brought the plant back up.

1107 reset propulsion.

1108 switched 2B loop out of service, snapped in prop alternator and began turning DM at 40 rpm's.

I remained in the EOS with a radio and monitored the plant.

1111 DM rpm's dropped to 26 rpm's, I radioed that we had lost rpm's, and asked if we wanted more turns, affirmative, and I bumped the throttle back up to 40 rpm's.

1113 DM 1A exhaust temp high, alarmed, on the alarm and monitoring system, AMS. I looked to make sure fans were running, realized this was the wrong end, and from the EOS tried to alert Oiler Sourelos as he ran by. Moments later we met at the EOS door and he asked if anyone was welding in the DM. He said there was "smoke and sparks", I said no!!

I immediately turned on the #1 MR camera, saw smoke and sparks in the camera view, hailed into the radio "we have a fire", hit the e-stop on #3 ME, snapped out the propulsion alternator, Oiler Sourelos rang the general alarm, BAC came into the EOS and tripped propulsion control. I looked around for any other fans to secure in the space, Oiler Sourelos ran back out to close the WTD into the #1 MR.

We shut down the plant, secured machinery, kept the space isolated and monitored from the EOS.

John Settles

ASCE Walla Walla

To:

Elizabeth Nicoletti  
Senior Port Engineer  
2901 3<sup>rd</sup> Ave  
Seattle, Wa 98102

From:

Alan Arnesen  
Chief Engineer M/V Walla Walla  
[REDACTED]  
Hansville, Wa 98340

Re: Drive Motor failure on the M/V Walla Walla

Miss Nicoletti,

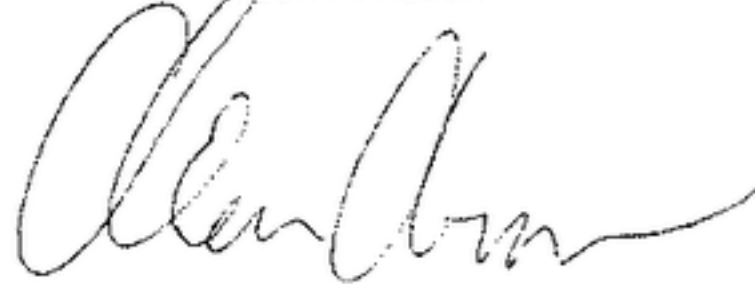
This is my statement pertaining to the event that happened on Sunday November 4<sup>th</sup>, 2012 aboard the Walla Walla.

I was assigned to work on the Walla Walla on the day in question. I arrived at approximately 0630; shortly after arrival I discussed the work for the day with SCE Cooper. I was to complete the removal, rebuilding, installing and testing of the main bilge pump. For most of the day I was working on this project with my crew. During the #1 drive motor failure my duties had taken me off of the ship. Upon my return I detected an electrical smell on the car deck. I found no crew members in the control room; they were in the number #1 drive motor room where the failure had taken place. The remainder of the shift was occupied with the completion of the main bilge pump project.

I was not directly involved with the work on the #2 drive motor. I observed some of the set up and overheard some of the discussions. It appeared that a thorough, thoughtful and comprehensive process was taking place to ensure the safe maintenance of the drive motors between SCE Cooper and Eagle Harbor technicians.

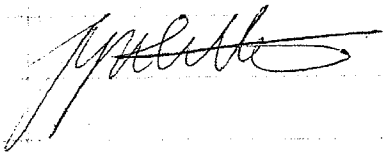
Respectfully submitted,

Alan Arnesen

A handwritten signature in black ink, appearing to read 'Alan Arnesen', written in a cursive style.

I, REYNALDO B. ESTEBAN MAKE THE FOLLOWING  
STATEMENT REGARDING THE INCIDENT THAT HAPPENED  
ON 4 NOVEMBER 2012 ONBOARD THE M/V WALLA WALLA.

I WAS ALIGNING THE PORT BILGE PUMP WHEN  
STEVE TOLD ME TO COME OUT OF THE BILGE. THIS  
HAPPENED APPROXIMATELY @ 1140. I WENT <sup>TO</sup> THE  
DAY ROOM AND AS I WAS PASSING BY #1 TUNNEL  
I SAW AND SMELLED THE SMOKE COMING FROM THE  
MOTOR ROOM. THIS IS THE FIRST TIME I KNEW WHAT  
HAPPENED.



Statement for the event that happened on the M.V. Walla Walla on 11-4-12 in Eagle Harbor.

Approxemently 11:15 AM on Sunday I was in the engine room working on the bilge pump with Rey Esteban. The #2 S.S. and the #3 M.E. were running. I was walking through the engine room heading toward the shop to get a wrench, that's when I noticed a burning smell. I looked around and I noticed a thick cloud of smoke coming from the #1 tunnel way. I thought someone was welding back in the #1 drive motor room. Just to make sure I walked to the #1 Mtr room. ( the smoke was getting thicker). I walked next to the #1 Drive motor, and looked where the smoke and arcing was coming from, and noticed a white and blue arc coming from inside the # 1A Drive Mtr. I then ran to the EOS and asked John Settles who was there, if any one was welding back in the #1 Mtr room. HE said no. Then I said there is a fire in the #1 drive motor, as I said that I quickly selected the camera to the #1 Mtr room to show J. Settles the white and blue arcing what I had just seen. When J. Settles saw the camera he quickly called the staff chief on the hand held radio and said there is a fire in the #1 drive Mtr and he is shutting every thing down. As J. Settles was shutting down I rang the general alarm for 10 seconds. I then ran back to the #1 tunnel way to close the water tight door. I then ran back to the EOS the bunker up a fire suit. When I got to the EOS I noticed the Eagle Harbor Electricians, Staff Chief, and J. Settles were looking at the camera and noticed the Arcing had went away. I noticed Rey Esteban was not in the EOS, and went out to the engine room to look for him and told him to come inside.

Stavros (Steve) Sourellos



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**From:** Day, Vern  
**Sent:** Monday, November 05, 2012 5:54 AM  
**To:** Nicoletti, Elizabeth  
**Subject:** S. Carpine Statement: Walla Walla drive motor damage

----- Original Message -----

**From:** Carpine, Steve  
**Sent:** Sunday, November 04, 2012 04:18 PM  
**To:** Kelly, Ran; Day, Vern  
**Cc:** Kuehl, Ken  
**Subject:** RE: Walla Walla drive motor damage

All four drive motors were megged on Friday, low readings were recorded. The decision was made to put heat on the drive motors and re-meg on Saturday postponing the hand stoning until Sunday.

Electric shop and vessel Engineers started the shift setting up to hand stone drive motor 2B. Drive motor 1A was also to be hand stoned following completion of 2B.

The hand stoning of 2B began at approximately 1110, Shaft speed was increased up to 40rpm. At approximately 1130 an engine crew oiler reported smoke from the No.1 motor room. The propulsion system was secured and the engine crew assessed the situation. After verifying no fire, the space was secured and preparations were started to ventilate the space. After a period, SCE Cooper allowed entry for a visual inspection of drive motor 1A revealing severe damage to the commutator of drive motor 1A. SCE Cooper instructed nothing be touched or altered without his direction

The turning of the shaft for the hand stoning of 2B was to be powered through Loop A with only drive motor 2A in the Loop turning the No.2 end shaft. Drive motor 1A was believed to be isolated from Loop A and was not. Loop A armature current passed through one brush row that had not been removed overheating and damaging the commutator of drive motor 1A.

The incident was reported by SCE Cooper to Port Engineer Mullan. I reported the incident to EH Port Engineer Kelly.

SCE Cooper and I decided because of the extent of damage and for the safety of our personnel we would stop work for the day and re-evaluate the incident tomorrow.

Steve Carpine  
WSF Vessel General Foreman

  
  
[carpins@wsdot.wa.gov](mailto:carpins@wsdot.wa.gov)

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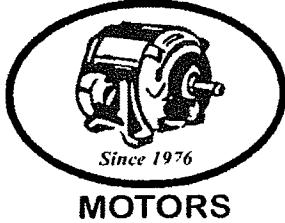
**From:** Kelly, Ran  
**Sent:** Monday, November 05, 2012 10:32 AM  
**To:** Day, Vern; Carpine, Steve; Nicoletti, Elizabeth; Browning, Tim  
**Subject:** Fw: walla walla drive motor stoning

Write up from Mr. Levang.

**From:** Levang, Mark  
**Sent:** Monday, November 05, 2012 10:26 AM  
**To:** Kelly, Ran  
**Cc:** Kuehl, Ken  
**Subject:** walla walla drive motor stoning

R.J. We set up Sunday the 4<sup>th</sup> to hand stone #2b comm. The plan was to power only motor #2a which shares a common shaft to hand stone #2b. Bruce and had discussed this plan and were in Agreement. We spent most of the morning preparing and started stoning about 11:30. The exciters in the #2 end had been set up so that only #2a was having excitation applied to it. I was left at the motor to oversee the stoning with my crew while Bruce went into the control room to bring the motor up to 40 shaft turns. When the motor was up to speed we began Hand stoning #2b motor comm. After about 10 to 15 minutes of hand stoning an oiler entered our motor room and told us the other end motor room was full of smoke. The plant was Immediately shut down.

## DELTA ELECTRIC



October 23, 2012

Washington State Ferries  
2901 3<sup>rd</sup> Ave, Suite 500  
Seattle, WA 98121-3014

Attn: Scott Mullen – [mullans@wsdot.wa.gov](mailto:mullans@wsdot.wa.gov)  
Bruce Cooper – [cooperb@wsdot.wa.gov](mailto:cooperb@wsdot.wa.gov)

RE: M/V Walla Walla Inspection, PO#S122-0528, Findings Report

### Findings Report

Condition found on all commutators:

-Uneven discoloration was found on all bars and on complete surface of commutator. One cause of this is atmospheric condition. Moisture and vapors introduced thru cooling and ventilation can cause enough contamination needed to produce heavy destructive film on commutator, a very low amount is needed. The most common cause is Sulfur (3 parts per million). That would be sufficient enough to cause heavy film and discoloration of copper similar of the type of markings you have on these commutators. The source of sulfur comes from vehicle exhaust thru ventilation. Another source of discoloration is uneven spring pressure. Uneven spring pressure will disturb the amount of load per brushes causing change in temperature between brushes that contribute to discoloration of commutator bars.

-Excessive dust was found in all motor. Excessive dust, in this case carbon, is produced by self seating of brushes. Excessive carbon dust causes the brushes to ride on the dust, disturbing surface contact between the brush and commutator surface causing unbalanced load between brushes.

2141 West Valley Hwy North  
Auburn, WA 98001  
(253) 833-1572 Fax (253) 833-7521

December 11, 2012

Recommendations:

- Use self cleaning brushes. These would be specific brushes for your application and it would need to be engineered. We use Daniel Perkins of Perkins Power Products, representative of Helwig Carbon brushes for our special brush needs.
- Replace and seat brushes 100% of surface on all brushes at one time, not the current system of 32 brushes at a time, every other month. Replacing all brushes at one time will take care of uneven spring tension caused by varying brush lengths and it will allow 100% contact on the commutator.

If you would like any additional information or explanation, please contact us to schedule a meeting in person.

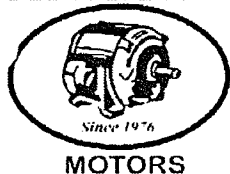
Sincerely,

Antonio Vacca

Michael DiPietro

**Delta Electric Motors, Inc.**  
2141 West Valley Hwy N  
Auburn, WA 98001  
Ph: 253-833-1572  
FX: 253-833-7521

DELTA ELECTRIC



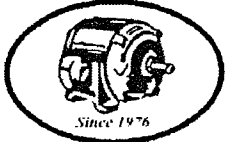
Delta Electric Motors, Inc.  
2141 W Valley Hwy N  
Auburn, WA 98001  
(253) 833-1572 Fax (253) 833-7521

10/5/2012  
Delta Job# 10953

Nameplate Data  
PM# 1 end #1

Motor # 222033-1A      EN 222033  
Type MCF12    HP 4250      RPM 180  
Volts 750      Amps 4510      Wound Shunt  
Class F Insulation      50 degrees C ambient      75 degrees C Rise TH  
Excitation Separate Volt 180      Amps 94.1 DC  
Ventilation 25000      CFM 4.5 In WSP  
Date March 2003  
Enclosure ESV IP44

DELTA ELECTRIC



MOTORS

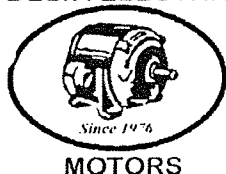
**Delta Electric Motors, Inc.**  
2141 W Valley Hwy N  
Auburn, WA 98001  
(253) 833-1572 Fax (253) 833-7521

Delta Job# 10953

Nameplate Data  
PM# 2 end #1

Motor # 222033-2      EN 222033  
Type MCF12    HP 4250      RPM 180  
Volts 750      Amps 4510      Wound Shunt  
Class F Insulation      50 degrees C ambient    75 degrees C Rise TH  
Excitation Separate Volt 180      Amps 94.1 DC  
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Date March 2003  
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DELTA ELECTRIC



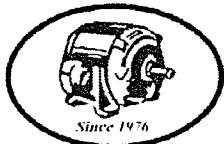
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Auburn, WA 98001  
(253) 833-1572 Fax (253) 833-7521

10/5/2012  
Delta Job# 10953

Nameplate Data  
PM# 3 end #2

Motor # 222033-3      EN 222033  
Type MCF12    HP 4250      RPM 180  
Volts 750      Amps 4510      Wound Shunt  
Class F Insulation      50 degrees C ambient      75 degrees C Rise TH  
Excitation Separate Volt 180      Amps 94.1 DC  
Ventilation 25000      CFM 4.5 In WSP  
Date March 2003  
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DELTA ELECTRIC



MOTORS

**Delta Electric Motors, Inc.**  
2141 W Valley Hwy N  
Auburn, WA 98001  
(253) 833-1572 Fax (253) 833-7521

10/5/2012  
Delta Job# 10953

Nameplate Data  
PM# 4 end #2

Motor # 222033-4      EN 222033  
Type MCF12    HP 4250      RPM 180  
Volts 750      Amps 4510      Wound Shunt  
Class F Insulation      50 degrees C ambient    75 degrees C Rise TH  
Excitation Separate Volt 180      Amps 94.1 DC  
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- Plant in equal mode
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John Settles

ASCE Walla Walla

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I was left at the motor to oversee the stoning with my crew while bruce went into the control room to bring the motor up to 40 shaft turns. When the motor was up to speed we began Hand stoning #2b motor comm. After about 10 to 15 minutes of hand stoning an oiler entered our motor room and told us the other end motor room was full of smoke. The plant was Immediately shut down.

Statement for the event that happened on the M.V. Walla Walla on 11-4-12 in Eagle Harbor.

Approxemently 11:15 AM on Sunday I was in the engine room working on the bilge pump with Rey Esteban. The #2 S.S. and the #3 M.E. were running. I was walking through the engine room heading toward the shop to get a wrench, that's when I noticed a burning smell. I looked around and I noticed a thick cloud of smoke coming from the #1 tunnel way. I thought someone was welding back in the #1 drive motor room. Just to make sure I walked to the #1 Mtr room. ( the smoke was getting thicker). I walked next to the #1 Drive motor, and looked where the smoke and arcing was coming from, and noticed a white and blue arc coming from inside the # 1A Drive Mtr. I then ran to the EOS and asked John Settles who was there, if any one was welding back in the #1 Mtr room. HE said no. Then I said there is a fire in the #1 drive motor, as I said that I quickly selected the camera to the #1 Mtr room to show J. Settles the white and blue arcing what I had just seen. When J. Settles saw the camera he quickly called the staff chief on the hand held radio and said there is a fire in the #1 drive Mtr and he is shutting every thing down. As J. Settles was shutting down I rang the general alarm for 10 seconds. I then ran back to the #1 tunnel way to close the water tight door. I then ran back to the EOS the bunker up a fire suit. When I got to the EOS I noticed the Eagle Harbor Electricians, Staff Chief, and J. Settles were looking at the camera and noticed the Arcing had went away. I noticed Rey Esteban was not in the EOS, and went out to the engine room to look for him and told him to come inside.

Stavros (Steve) Sourelas

Nicoletti, Elizabeth

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From: Day, Vern  
Sent: Monday, November 05, 2012 5:54 AM  
To: Nicoletti, Elizabeth  
Subject: Fw: Walla Walla drive motor damage

----- Original Message -----

From: Carpine, Steve  
Sent: Sunday, November 04, 2012 04:18 PM  
To: Kelly, Ran; Day, Vern  
Cc: Kuehl, Ken  
Subject: RE: Walla Walla drive motor damage

All four drive motors were megged on Friday, low readings were recorded. The decision was made to put heat on the drive motors and re-meg on Saturday postponing the hand stoning until Sunday.

Electric shop and vessel Engineers started the shift setting up to hand stone drive motor 2B. Drive motor 1A was also to be hand stoned following completion of 2B.


The hand stoning of 2B began at approximately 1110, Shaft speed was increased up to 40rpm. At approximately 1130 an engine crew oiler reported smoke from the No.1 motor room. The propulsion system was secured and the engine crew assessed the situation. After verifying no fire, the space was secured and preparations were started to ventilate the space. After a period, SCE Cooper allowed entry for a visual inspection of drive motor 1A revealing severe damage to the commutator of drive motor 1A. SCE Cooper instructed nothing be touched or altered without his direction

The turning of the shaft for the hand stoning of 2B was to be powered through Loop A with only drive motor 2A in the Loop turning the No.2 end shaft. Drive motor 1A was believed to be isolated from Loop A and was not. Loop A armature current passed through one brush row that had not been removed overheating and damaging the commutator of drive motor 1A.

The incident was reported by SCE Cooper to Port Engineer Mullan. I reported the incident to EH Port Engineer Kelly.

SCE Cooper and I decided because of the extent of damage and for the safety of our personnel we would stop work for the day and re-evaluate the incident tomorrow.

Steve Carpine  
WSF Vessel General Foreman

  
[carpins@wsdot.wa.gov](mailto:carpins@wsdot.wa.gov)

-----Original Message-----

From: Kelly, Ran  
Sent: Sunday, November 04, 2012 1:14 PM  
To: Carpine, Steve; Day, Vern  
Subject: Walla Walla drive motor damage

Steve,

Please sit down today and send me a detailed email outlining the events of this afternoon.



## Lockout / Tagout Record Sheet

A description of the work being performed and of the locked/tagged out equipment also must be entered in the Engine Room Log Book or Terminal Supervisor's Watch Handover Notes.

#2 Drive Motor

Date Locked or Tagged	Equipment Description or W/O # Energy Source Secured: Air - Gas - Steam Gravity - Spring - Fluid	Lock Number	Person Setting Locks / Tags	Date Cleared	Person Removing Locks / Tags	Equipment Operational? Indicate (Yes/No)
11/2/12	#2 DM	6140	DAVID CORREIA Print Name	11/2	DAVID CORREIA Print Name	NO
11/2	"	6140	" Print Name	11/2	DAVID CORREIA Print Name	NO
11/3	"	6140	" Print Name	11/3	DAVID CORREIA Print Name	NO
11/4	#2 DM	6140	George Print Name	11/4	George Print Name	NO
11/4	"	6140	M. Ball Print Name	11-4	M. Ball Print Name	NO
11/4	"	6140	D. Correy Print Name	11/4	D. Correy Print Name	NO
11/4/12	"	2022	Sublette Print Name	11/4	Sublette Print Name	NO
11/11/12	"	3219	Mike Green Print Name	11/4	Mike Green Print Name	NO
11/12	"	3219	Sergey Print Name	11/4	Sergey Print Name	NO
11/14	"	6140	D. Correy Print Name	11/4	D. Correy Print Name	NO
11/14	"	6140	D. Correy Print Name	11	D. Correy Print Name	NO